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(54) **SYSTEM AND METHOD FOR ENHANCED ROUTING AND RESERVATION PROTOCOL**

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(56) **References Cited**

U.S. PATENT DOCUMENTS

5,297,137 A		3/1994	Ofek et al.	370/60
5,825,772 A		10/1998	Dobbins et al.	370/396
5,832,196 A	*	11/1998	Croslin et al.	714/4
6,011,780 A	*	1/2000	Vaman et al.	370/237
6,047,006 A	*	4/2000	Brakefield et al.	370/524
6,359,903 B1	*	3/2002	Shimade et al.	370/468
6,424,624 B1	*	7/2002	Galand et al.	370/231

OTHER PUBLICATIONS

Decentralized Network Connection Preemption Algorithms, Mohammad Peyravian and Ajay D. Kshemkalyani, Computer Networks and ISDN Systems 30 (1998) 1029–1043, 15 pages total.
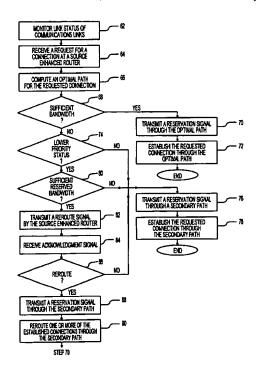
* cited by examiner

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(57) **ABSTRACT**

A network node and a method of dynamically reconfiguring routes of established connections in a communications system operate to provide the optimal path for a new connection based on a priority status of the new connection. The optimal path is provided even when a communication link on the optimal path does not have a sufficient amount of available bandwidth to accommodate the new connection. The network node operates in conjunction with other network nodes in the system to reroute one or more established connections that have reserved bandwidth on a communication link on the optimal route and have a lower priority status than the new connection, thereby increasing the available bandwidth on the communication link to accommodate the new connection. The network node also performs conventional functions of a router. The network node and the method can be implemented in any communications system where information is transmitted in packets, blocks, frames or cells. The network node includes a reroute-signal generator, a network monitor and a reservation unit that operate with a CPU of the node to perform the rerouting operation.

11 Claims, 5 Drawing Sheets